City of Somerville Lead Abatement Program, Soil Sampling Protocol

The techniques, materials, and practices described below are written to comply with EPA soil sampling protocols as set forth in Work Assignment 4-10(02), MRI Project No. 9803, March 1995[1]; EPA document 747-R-93-011[2]; and HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (document HUD-1539-LBP)[3].

1. Sampling Procedure

To ensure proper results, the licensed risk assessor shall abide this established soil sampling protocol:

1.1. Sketch an exterior site plan of the property following the procedure described in Section 3 below, specifically identify sampling areas;

1.2. Following the procedures outlines in Section 5, collect at least six sub-samples from each sampling area and record these locations on the site plan;

1.3. Repeat this procedure Step 1.2 for each sampling area with a blank between each composite sample set.

2. **Materials**

The licensed risk assessor shall utilize the following materials to collect samples from properties on behalf of **The City of Somerville Lead Abatement Program (SLAP)**:

2.1. A Sample Collection Kit, consisting of:

2.1.1. Industrial strength, re-sealable, clear plastic bags, which are at least 4 millimeters thick;

2.1.2. Labels;

2.1.3. Disposable, non-sterile, non-powdered gloves;

2.1.4. A pen or permanent marker;

2.1.5. Paper towels;

2.1.6. Water;

2.1.7. Trash bags;

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[1] United States Environmental Protection Agency. *Residential Sampling for Lead: Protocols for Dust and Soil Sampling*. Work Assignment 4-10(02), MRI Project No. 9803. Washington D.C., 1995.
[2] United States Environmental Protection Agency, Office of Pollution Prevention and Toxics. *Data Analysis of Lead in Soil and Dust.* EPA 747-R-93-011. Washington D.C., 1993.
[3] U.S. Department of Housing and Urban Development. *Guidelines for the Evaluation and Control of Lead-based paint Hazards in Housing*. HUD 1539-LBP. Washington D.C., 1997.

2.1.8. Field blank soil; and

2.1.9. Cleaning brush.

2.2. Several other collection instruments are also necessary:

2.2.1. Stainless steel sieve set: laboratory-issued sieve #30/35 with pan and cover;

2.2.2. Plastic buckets; and

2.2.3. Steel gardening trowel.

3. **Exterior Site Plan**

For consistency, the licensed risk assessor shall sketch each property in the following manner.

3.1. Sketch the general layout of the perimeter of the property, the placement of permanent and temporary structures, and existing vegetation. The risk assessor shall approximate distances by eye or walk-off procedures.

3.2. Label the house clockwise by sides, with "A" representing the front side (abutting the street to which the parcel's address belongs), "B" for the left side, "C" for the back of the house, and "D" for the right side. All parcels with more than four sides to the property boundary shall continue naming sides with sequential letters, clockwise from the street.

3.3. Approximate distances from the structures to the street shall be drawn in, and "A" shall be noted as "Street."

3.4. Identify and label on the sketch usage areas on the parcel, including play areas, walkways, trash alleys or sheds, gardening areas, and pet pens.

3.5. Identify and label all impermeable surfaces and other characteristics, such as paved areas or debris piles.

3.6. Note the time of day and the weather in which the samples were taken.

3.7. The risk assessor shall assess additional risk factors, including but not limited to: neighboring properties and structures, industrial or commercial usage, adjacent land uses, and the presence of lead paint chips in the yard, or peeling exterior surfaces on the house in question.

4. **Sampling Areas**

One composite sample, consisting of at least six, but not more than ten sub-samples, shall be taken from the following locations within the yard whenever possible:

4.1. Drip Line- the area one to three feet from the perimeter of the house. Sub-samples shall be equally spaced around the house, with at least two feet between each.

4.2. Play Area- clearly identified area in which children play, marked by outdoor play equipment or the presence of matted grass or a child's playthings. Sub-samples shall be collected in the most exposed locations of a Play Area and should be equally spaced within the zone.

4.3. Vegetable Garden- demarcated location in which edible plants are grown at any point during the year. Sub-samples should be equally spaced throughout the entire Vegetable Garden.

4.4. Bare Soil locations shall be sampled and noted as the particular usage area (see subsection 3.4 above) in which the bare soil is located. Sub-samples shall be equally spaced within the identified usage area. If there are multiple bare soil locations, these shall count as individual sampling locations.

4.5. Other locations in the yard are those that are not habitually used for any purpose (i.e., not in an identified usage area) but are accessible to children. Sub-samples shall be equally spaced within the identified area.

5. Sampling Instructions

The licensed risk assessor shall abide by the following guidelines:

5.1. Avoid taking soil samples when the ground is wet or frozen. If the sample must be taken wet, the Lab will dry and sieve the soil and the risk assessor shall simply place the recommended quantity into the re-sealable plastic bag.

5.2. The trowel and all other sampling instruments, including the sieve, shall be cleaned thoroughly after each sample. New, clean gloves and paper towels shall be used to take each sample and clean the instruments after each sample.

5.3. To complete one composite sample, the risk assessor shall:

5.3.1. Identify a sampling area and remove leaves, vegetation, and debris from the location and mark the area.

5.3.2. With the trowel, the risk assessor shall dig a sub-sample hole of a depth of two inches. If a two-inch depth cannot be attained, the risk assessor shall discard all soil from the trowel and try a different sub-sample location.

5.3.3. In the two-inch deep hole, the risk assessor shall take a one-inch thick slice from the edge of the hole. He or she shall remove large stones, debris, and twigs, but not decayed material that is part of the soil. Place the soil in the mixing bucket.

5.3.4. The risk assessor shall wipe the trowel clean and repeat Steps 6.3.1 through 6.3.3 to obtain at least six, but not more than ten sub-samples.

5.3.5. S/he shall thoroughly mix the composite sample with a clean trowel.

5.3.6. S/he shall filter the composite sample through a #30/35 sieve by placing the entire composite sample inside the sieve and placing the lid on it. Holding the entire sieve firmly, the risk assessor shall shake vigorously with one hand while tapping on the lid with the other hand for thirty seconds to one minute to allow the sample to settle. S/he shall remove the lid and the sieve, and discard all debris that did not pass through the sieve into a trash bag. With a clean trowel, the risk assessor shall place 1 cup of the filtered soil into the re-sealable plastic bag.

5.3.7. The risk assessor shall clean and dry all sampling instruments thoroughly.

5.3.8. One field blank shall be used between each composite "sampling area" sample that is collected. Field blanks should be enclosed in the sampling materials from the laboratory. Each blank consists of one cup of "clean" potting soil and is used to rule out the possibility of contamination during the sampling process. The field blank soil shall be transferred to the re-sealable bags in the same manner as the field samples, and labeled as "field blank."

5.3.9. The risk assessor shall repeat steps outlined in Section 5.3 for each identified sampling area on the site, for up to three composite samples, placing a field blank between each composite sample.

5.4. The risk assessor shall take note that all samples, including the field blanks, are properly labeled and that all information corresponds with the information recorded on the laboratory slip in accordance with Sampling Preparation Protocol EPA600/R-93/200.

5.5. The risk assessor shall place all of the samples in a box and deliver to the laboratory for analysis.

6. Sample Preparation

The licensed risk assessor and his or her parent company (the contractor) shall verify that the chosen analytical laboratory follows the preferred Sample Preparation Protocol, EPA 600/R-93/200.

7. Sample Analysis

The licensed risk assessor and his or her parent company (the contractor) shall verify that the chosen analytical laboratory follows the preferred Sample Analysis Protocol, EPA SW846 7420.

8. Soil Test Results

Soil samples must be shipped to the laboratory within 24 hours of collection and processed within 3 days of receipt by the laboratory. The Consultant must fax all soil tests results to SLAP within 24 hours of receipt from the laboratory.

8.1. The site location plan, fully marked by the risk assessor, including date, risk assessor's name, and site address;

8.2. The laboratory preparation slip, describing the location of each sample and having the address of the property on the top; and

8.3. The laboratory results, with lead-in-soil concentration in parts per million (ppm) for all field samples and the field blanks.

City of Somerville, Lead Abatement Program Vertical Soil Sampling Protocol

Remove loose stones, debris and paint chips from the surface and excavate a 2-inch deep hole approximately 12 inches in diameter. Place a soil sample from these top two inches in a bowl or plastic bag, mix well and clearly identify sample as "2 INCHES".

Excavate 4 more inches and take a sample at 6-8" in depth. Repeat the process about every two inches for the first foot of depth.

Final Samples at each sampling hole should be at:

- Sample One: 0-2" depth
- Sample Two: 6-8" depth
- Sample Three: 8-10" depth
- Sample Four: 10-12" depth

Follow same blanking and equipment cleaning protocol as previously outlined in SLAP Soil Testing Protocol (Appendix A1)

END.